REMARKS

Claims 1-4 and 6-12 are pending in the present application. Claim 1 has been amended. Reconsideration of the claims is respectfully requested.

I. 35 USC §112, Second Paragraph

The Examiner has rejected claim 1 under 35 USC §112, second paragraph, because there is insufficient antecedent basis for the term "that" recited in lines 2, 4, 6, 8 and 13 of the claim.

The word "that" does not describe a feature of the invention and is not a limitation that requires an antecedent basis, nor has the Examiner cited any authority to support such an interpretation of "that." Rather "that" is merely a conjunction that introduces functional limitations in subordinate clauses.

The Examiner has objected to the limitation "said broadcast system" in claim 1 since it is unclear whether it is the same as the wireless data broadcast system recited at the beginning of the claim. Claim 1 has been amended to clarify that said broadcast system it is indeed the wireless data broadcast system.

The Examiner has also objected to the limitation "the broadcast repeater system" in claim 1 since it is unclear whether it includes the broadcast repeaters recited earlier in the claim. Claim 1 has been amended to clarify that the broadcast repeater system is in fact the broadcast repeaters mentioned previously in the claim.

Therefore, it is respectfully asserted that the rejection of claim 1, under 35 USC §112, second paragraph, has been overcome and should be withdrawn.

II. 35 U.S.C. §103, Anticipation

The Examiner has rejected claims 1-4 and 6-12 under 35 USC §103(a) as being unpatentable over Judd et al. (US Pub. No. 2004/0110469) in view of Pecus et al. (US Pub. No. 2007/0255829). This rejection is respectfully traversed.

Regarding claim 1, the Examiner writes:

> Regarding claim Judd [sic] discloses a system for data transmission and reception comprising (abstract):
>
> (a) a wireless data broadcast system that broadcasts outgoing data from a data network to a plurality of users (Fig. 35 and 36, and page 9 par. 0172 – 0173; a

base station is broadcasting signals to mobile subscribers); wherein said broadcast system includes one or more broadcast repeaters that receive data at one frequency and retransmit said data at another frequency (see page 7, par. 0145, pg. 8, par. 0161 – 0163; the frequency is converted) and wherein the broadcast system incorporates satellite data transmission technology in a terrestrial line-of-sight environment (see pg. 18, par. 0260 – 0264; signals transmitted by satellites are transmitted inside a structure)

(b) a wireless data return path system that receives incoming data from said plurality users [sic] and provides the incoming data to said data network, wherein the wireless data return path system includes (see pg. 7, par. 0145 – 0146; the conversion unit works in the reverse directions as well):

one or more wireless collector systems receiving data from a predetermined set of the plurality of users (pg. 9, par. 9171 [sic] – 0174; a mobile-facing antenna exchanges singles [sic] with mobile subscribers); and

one or more return path system repeaters that receive data at one frequency from one or more predetermined wireless collector systems and retransmit said data at another frequency ((see page 7, par. 0145, pg. 8, par. 0161 – 0163; the frequency is converted downlink and uplink).

The present invention utilizes four unique frequencies for the broadcast and return path (frequencies F1, F2, F3, and F4; see paragraphs 0032 and 0033 of the published application). The broadcast path and return path in the present invention are not mirror images of each other.

The Judd invention provides a way to improve isolation between antennae on opposite sides of a flat-panel repeater. One side of the repeater transmits to and receives from a base station. The other side transmits to and receives from mobile users. The Judd invention employs orthogonal antennae on opposite sides of the flat-panel repeater in order to improve isolation between them. The antennae on opposite side of the repeater are fixed in position assure maximum isolation and maximum gain.

Judd supplements this orthogonal arrangement with other methods to further improve isolation of the signals. One approach is the use of radio frequency chokes in the enclosure of the repeater between the antennae to reduce coupling between the antennae. Another is the use of an adaptive interference canceller to provide additional gain and phase margin. Alternatively, antenna elements on opposite side of the repeater might produce circularly polarized radiation patterns. As pointed out by the Examiner, another method for improving isolation between the antennae is to have the wireless connection to the base station on a different frequency band from the wireless connection to mobile

users. However, this use of different frequencies in Judd is not the same as that recited in the claimed invention.

In the Judd invention the use of different frequencies is divided between the two sides of the repeater. It is not divided between a broadcast path and return path each with their own repeaters, as in the present invention. Judd discloses receiving a signal at a first frequency at either the base station-facing side or mobile side and retransmitting the amplified signal on the opposite side at either the same frequency or a second frequency to improve isolation of the antennae. Return path transmissions follow the same path in reverse, received at the first (or second) frequency and retransmitted on the other side at the first frequency. Therefore, transmission and reception from the repeater only involve one or two frequencies, and the broadcast and return paths both go through the same repeater. This is true even when the repeaters are daisy chained, which increases the number of repeaters through which the signals pass but does not divide the broadcast and return paths between separate repeaters.

In contrast to Judd, the present invention divides the broadcast and return paths between separate repeaters. These paths are one way. The broadcast repeater(s) of the present invention receive and retransmit data at two different frequencies. The return path repeater(s) in turn receive and retransmit data at two other frequencies which are different from those used by the broadcast repeaters.

In most embodiments of Judd, the signal is down-converted to an intermediate frequency for filtering between the two antennae of the repeater and then up-converted back to the original frequency or a second frequency. However, this intermediate frequency is only used internally within the repeater to avoid interference with the transmission bands and is not used in any transmissions.

The sections of Judd to which the Examiner refers do not teach the limitations of the claimed invention. Specifically, paragraph 145 reads:

> [0145] If it is desired to distribute multiple wireless services within a building, such as PCS, MMMDS, LMDS, wireless LAN, cellular telephone, etc., all such signals may be supplied from their receiving antenna(s) to an Ethernet hub before entering the daisy-chained indoor repeaters, as illustrated in FIGS. 23a and 23b. A separate antenna 110 and electronic circuits 111 are provided for each wireless service, and all the circuits 111 are connected to an Ethernet hub 112. Each of the

> circuits 111 includes a frequency converter for converting signals from the frequency used by the wireless service to an Ethernet frequency. The Ethernet hub 112 controls the forwarding of the signals from the multiple wireless links to the single wired connection from the Ethernet hub 112 to an indoor flat-panel repeater 113, which then relays those signals on to other repeaters such as repeaters 114 and 115 located throughout the interior of the building.

As can be seen this section of Judd merely discloses the use of an Ethernet hub to collect signals from multiple types of sources before forwarding the data to a flat-panel repeater.

Paragraphs 161-163 of Judd discuss the function of an adaptive cancellation circuit inside the flat panel repeater that removes feedback signals:

> [0161] FIG. 24 shows a block diagram of one path through a repeater system. The input signal, S(t), either from the base station (for the downlink path), or from the mobile user (for the uplink path), is received via an antenna 120, bandpass filtered at 126a, amplified at 128 (with active gain=G), filtered again at 126b, and finally transmitted by an antenna 122. Some of the transmitted signal energy couples back (through space, or through the electronics) into the receive antenna. This is denoted in FIG. 24 as the feedback signal, f(t), which is simply a delayed version (attenuated) of the original signal, S(t). Therefore, the composite signal, S(t)+f(t), is fed into the amplifier, with output G(S(t)+f(t)). Assume, for example, that the antennas have 0 dBi gain, then the new feedback signal is G f(t). The propagation of this signal, back to the input antenna, will incur attenuation, H. Therefore, the amplified, attenuated signal at the input antenna will be H G f(t). If this signal is comparable in power to the original signal S(t), then the amplifier 128 will go unstable, and oscillate (ring). This oscillation will cause severe distortion in the desired signal.

> [0162] FIG. 25 shows the same circuit as FIG. 24; however, adding an adaptive cancellation circuit 140. The goal of this circuit 140 is to create a inverse f(t) signal-f(t) (a 180 degree shifted f(t) signal), and sum it with the input signal, including the feedback signal, f(t), at a summing junction 145, and thereby remove the feedback signal f(t).

> [0163] FIG. 26 shows a general block diagram (high level) of one form of the adaptive cancellation circuit 140. In this approach, the input (RF) signal is summed at the junction 145 with a modulated signal constructed via a digitally adaptive process, to destructively interfere with the feedback signal embedded in the input composite signal. After the summation, the composite signal, S(t)+f(t), is digitally sampled and digitally processed via a digital signal processor (DSP) 150, which computes an intermediate signal for a modulator 152. The modulator 152 takes the intermediate signal, and a sample of the amplified (output) signal, and creates a near copy of the correct inverted f(t) signal-f(t). This process will work with many, if not most, of the digitally adaptive algorithms for feedback control.

> Additionally, this methodology does not require an injected signal (training or pilot tone, or wideband noise), for the adaptive process.

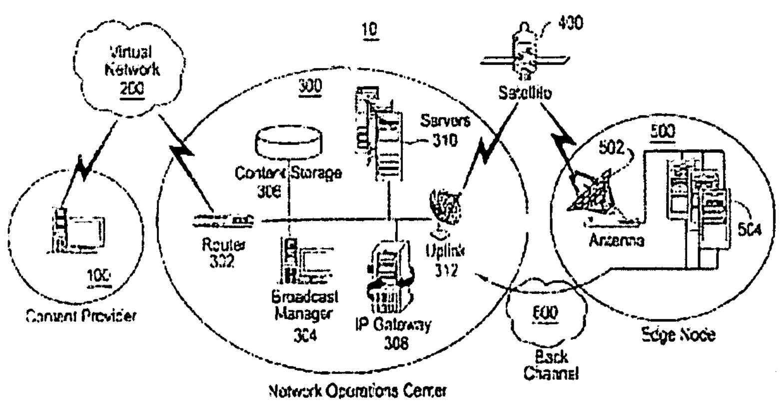
This adaptive cancellation circuit has no direct relevance to the limitations of the claimed invention.

The discussion of GPS signals in paragraphs 260-264 relates to a method for repeating GPS signals to fill GPS null or "blank" areas within structures. This aspect of Judd involves the reception and repeating of actual GPS satellite signals by using a satellite antenna system in conjunction with the repeaters. Though the repeaters are repeating the satellite signals within the building, the repeaters themselves are not actually incorporating satellite data transmission technology. In the Judd disclosure, the only satellite transmission technology is in the GPS satellite, not the terrestrial repeaters.

With regard to the limitation of using satellite data transmission technology, the Examiner writes:

> Judd does not explicitly teach wherein the broadcast repeater system incorporates satellite data transmission technology that includes antennas that transmit data users [sic] at more than 100 Mbps in a terrestrial line-of-sight multicast. However, Pecus teaches wherein the broadcast repeater system incorporates satellite data transmission technology that includes omnidirectional antennas (par. 0109; "receive only" antenna) that transmit data to users at more than 100 Mbps in a terrestrial line-of-sight multicast (see par. 0112).

Pecus does not teach the use of satellite transmission technology in a terrestrial line-of-sight multicast. Instead, Pecus uses a standard satellite transmission (a satellite in space) between a Network Operations Center (NOC) and an edge node, as shown in Figure 1 of Pecus below:



The edge node in turn delivers the data to a last mile service provider that provides the internet connection to the end user.

As can be seen in Figure 1, Pecus uses a standard satellite transmission via an orbiting satellite 400. In order for the satellite transmission technology to be used in a terrestrial line-of-sight multicast as recited in the claims, the data transmission between antenna 312 and antenna 502 would have to be directly between each other, without going through satellite 400 as taught in Pecus.

Paragraph [0109] to which the Examiner refers merely describes the structure and mounting of the edge node antenna 502. However, there is no mention of the use of this antenna for terrestrial line-of-sight transmission. Furthermore, paragraph [0108] specifically states that this antenna receives data from the satellite 400, not directly from the NOC antenna 312.

Paragraph [0112] describes a computer rack as shown in Figure 6. There is nothing in this description that refers to terrestrial line-of-sight transmissions at 100 Mbps. Rather, it describes Ethernet connections at 100 Mbps:

> [0112] FIG. 6 depicts an exemplary EN rack that may comprise four dual-733 MHz Intel Pentium III processor servers (e.g., the Power Edge 2450 model server from Dell Computer Corp.), an RF gain amplifier, two satellite routers (e.g., the Enterprisel from Harmonic Data Systems), a network switch (e.g., Model Catalyst 2924 from CISCO Systems), two remote power controllers (e.g., Model AP9211 from APC), a firewall device (e.g., model NetScreen-10 from NetScreen Technologies), multiport keyboard/display controller (e.g., model KVM-8 from APC), and keyboard/mouse/display unit. Two of the servers are configured for non-live content and the other two servers are configured for a live-broadcasting, and each has a 72 Gigabit disk array attached (e.g., the Power Vault 2005 model from Dell Computer Corp.). Alternatively, each server may be configured to send simultaneously both live and non-live content. The cabinet dimensions may be, for example, 19".times.36".times.84". However, any other size or number of racks may be used to accommodate the rapid growth of high speed internet users. For example, two of the racks may be used side-by-side for system expansion. **For network connectivity, a total of nine 100 Mbps fast Ethernet connections may be used to the routers of the LMSP**. Eight of the routers may be used to stream video to LMSPs, and the ninth may be used for the edge server switch. Alternatively, a single Gigabit Ethernet connection may be used to the LMSP routers. (emphasis added)

Therefore, Pecus does not disclose the invention features missing from Judd. Consequently, the proposed combination of Judd and Pecus does not produce all of the limitations of the claimed invention.

Because claims 2-4 and 6-12 depend from claim 1, they are distinguished from Judd for the reasons explained above.

III. <u>Response to Arguments</u>

In response to Applicant's previous arguments and claim amendments, the Examiner writes:

> The applicant argues on page 1 of the remarks that Judd fails to teach "unique frequencies for the broadcast and return path. The broadcast path and return path are not mirror images of each other". Calling the frequencies first, second, third and fourth does not clarify that the frequencies are different numbers. The claim doesn't state this limitation.

The adjectives "first," "second," "third," and "fourth" describe an ordinal or sequential relationship between separate entities, and their use is a well established method for describing similar but distinct elements in a claim. By asserting that the adjectives "first," "second," "third," and "fourth" do not clarify different frequencies, the Examiner implies that they could refer to the same frequency, which would distort their plain meaning as well as their common used in patent claim language. Nor has the Examiner cited any supporting authority for such an interpretation.

Furthermore, the "ordinary meaning" of a claim term is its meaning to the ordinary artisan after reading the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (*en banc*). The Federal Circuit has held that the specification plays a more important role in the claim construction process than dictionary definitions. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1320-21 (Fed. Cir. 2005) (*en banc*). The person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the term appears, but in the context of the entire specification. *Id.* at 1313.

In the present case, the ordinary plain meaning of the adjectives "first," "second," "third," and "fourth" is perfectly congruous with the specification. With reference to the broadcast repeaters and return path repeaters, the specification in paragraphs 0032 and 0033 describes the

conversion of the carrier wave between frequencies F1, F2, F3 and F4. Anyone of ordinary skill in the art would reasonably interpret the recitation of "first," "second," "third," and "fourth" frequencies as clearly being different from each other, especially since there is no other practical way to distinguish them from each other. The Applicant is receptive to any terminological suggestions the Examiner may offer to clarify the distinction between the different frequencies employed by the invention.

The Examiner goes on to write:

> The applicant argues that Judd employs that the frequencies of Judd are divided between two sides of the repeater. The claim does not say that the frequency is divided between a broadcast path and a return path each with their own repeaters. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., dividing frequencies into two, each with their own repeaters, not retransmitting through the same path, and the frequencies not converting internally) are not recited in the rejected claim(s).

Claim1 clearly recites separate a wireless data broadcast system in part (a) which includes one or more broadcast repeaters. Claim 1 also recites a wireless data return path system in part (b) which includes its own return path system repeaters:

> 1. A system for data transmission and reception comprising:
> (a) ***a wireless data broadcast system*** that broadcasts outgoing data from a data network to a plurality of users, wherein said wireless data broadcast system includes one or more ***broadcast repeaters*** that receive data at a ***first frequency*** and retransmit said data at a ***second frequency***, and wherein the broadcast repeaters incorporate satellite data transmission technology that includes omnidirectional antennas that transmit data to users at more than 100 Mbps in a terrestrial line-of-sight multicast; and
> (b) ***a wireless data return path system*** that receives incoming data from said plurality of users and provides the incoming data to said data network, wherein the wireless data return path system includes:
> one or more wireless collector systems receiving data from a predetermined set of the plurality of users; and
> one or more ***return path system repeaters*** that receive data at a ***third frequency*** from one or more predetermined wireless collector systems and retransmit said data at a ***fourth frequency***.

(emphasis added)

Claim 1 clearly states in part (a) that the broadcast repeaters receive data at a first

frequency and retransmit the data at a second frequency. Similarly, claim 1 also states in part (b) that the return path repeaters receive data at a third frequency and retransmit the data at a fourth frequency. Therefore, claim 1 does indeed recite separate broadcast and return paths, each with their own respective frequencies.

Therefore, it is respectfully asserted that the rejections of claims 1-4 and 6-12 under 35 USC §103 has been overcome and should be withdrawn.

CONCLUSION

It is respectfully urged that the subject application is patentable over references cited by Examiner and is now in condition for allowance. If there are any outstanding issues that the Examiner feels may be resolved by way of a telephone conference, the Examiner is cordially invited to contact Christopher O'Hagan or David W. Carstens at 972.367.2001.

The Commissioner is hereby authorized to charge any additional payments that may be due for additional claims to Deposit Account 50-0392.

Respectfully submitted,

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